



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,804	02/27/2004	Feng Shi	13854-065001	5657

26181 7590 02/09/2007
FISH & RICHARDSON P.C.
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER

TRAN, DZUNG D

ART UNIT	PAPER NUMBER
----------	--------------

2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.		Applicant(s)	
	10/789,804		SHI ET AL.	
	Examiner		Art Unit	
	Dzung D. Tran		2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 21 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Bullow U.S. (Publication no. 2002/0126355).

Regarding claims 1 and 17, Bullow, in figure 3, discloses a dispersion compensation device/method comprising:

a first order dispersion compensator 21 (equivalent to Optical domain Adaptive Dispersion Compensation Module (OADCM) operable to provide a first order dispersion compensation to a received signal having a plurality wavelengths;

a second order dispersion compensator 25 (equivalent to Electrical domain Adaptive Distortion Compensation Module (EADCM) operable to provide a second and higher order dispersion compensation; and

a controller (i.e., the combination of 23, 24, 27 and 28 coupled to both the OADCM and the EADCM (see figure 3), the controller operable to selectively control a

level of the first and the second dispersion compensation to be applied to the receive signal (pages 3-4, paragraphs 0048-0051).

Regarding claim 2, Bulow, in figure 3, clearly discloses the controller 24 and controller 28 control operating characteristics of at least one of the OADCM and the EADCM.

3. Claims 1-4, and 7-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Dai et al. U.S. (Publication no. 2003/0011847).

Regarding claims 1 and 17, Dai, in figure 1, discloses a dispersion compensation device/method comprising:

a optical dispersion compensator 7 and 9 (equivalent to Optical domain Adaptive Dispersion Compensation Module (OADCM) operable to provide a first dispersion compensation to a received signal having a plurality wavelengths (page 4, paragraph 0049);

a electrical dispersion compensator FFE 13 (equivalent to Electrical domain Adaptive Distortion Compensation Module (EADCM) operable to provide a second dispersion compensation (page 4, paragraph 0052); and

a controller (i.e., DSP 28) coupled to both the OADCM and the EADCM (see figure 1), the controller operable to selectively control a level of the first and the second dispersion compensation to be applied to the receive signal (page 5, paragraph 0059).

Regarding claim 2, Dai, in figure 1, clearly discloses the controller 28 control operating characteristics of at least one of the OADCM and the EADCM.

Regarding claim 3, Dai further discloses the controller 28 controls the OADCM based on feedback information provided to the controller from the FFE 13 (i.e., equivalent to EADCM).

Regarding claim 4, Dai further discloses the controller 28 controls the FFE 13 (i.e., equivalent to EADCM) based on feed forward information provided to the controller from the OADCM (see figure 1).

Regarding claim 7, Dai further discloses optical receiver (e.g. photo-detector 11) integrate with an optical variable dispersion compensator 7 and 9 (equivalent to OADCM), wherein the EADCM) provides signal distortion measurements to the controller 28. The controller 28 generates a dispersion compensation control signal corresponding to dispersion compensation quantity correction value (e.g., from the eye pattern of input waveform and equalization amplified waveform monitoring) then supplying it to the optical variable dispersion compensator 7 and 9 (equivalent to OADCM) (Figure 1).

Regarding claim 8, Dai further discloses the EADCM provides polarization mode dispersion compensation (page 4, paragraph 0052).

Regarding claim 9, Dai discloses the optical variable dispersion compensator OADCM provides chromatic mode dispersion compensation (page 4, paragraph 0049).

Regarding claim 10, Dai discloses the EADCM include an equalizer monitor (i.e., eye opening detector) that produces symbol estimate.

Regarding claim 11, Dai discloses the EADCM include a multi-phase eye quality monitor (i.e., eye opening Y detector , eye opening X detector) (e.g., it is well recognized in the art for use eye pattern for determine the error values).

Regarding claim 12, Dai discloses in figure 1 an optical transmitter¹ coupled to the receiving apparatus 11 through EDFA amplifier 5.

Regarding claim 13, Dai discloses the EADCM comprises: a multi-phase eye quality monitor (i.e., eye opening Y detector , eye opening X detector) operable to provide signal distortion measurements of an incoming electrical signal received at an equalization circuit 14 (figure 1).

Regarding claim 14, Dai discloses the EADCM comprises: CDR for retrieving clock signal from the incoming signal;

a first comparator path (i.e., eye open Y detect) thru decision circuit 15 for comparing a first portion of the incoming signal to a scanning reference, the first comparator path timed according to the clock signal from the clock recovery path;

a second comparator path (i.e., eye open Y detect) thru decision circuit 15 for comparing a second portion of the incoming signal to an optimal timing reference, the second comparator path timed according to the clock signal from the clock recovery path; and a difference accumulator for keeping track of the number of instances that respective outputs from the first and second comparator paths differ, as a measure of the eye quality (see Figure 1).

Regarding claim 15, Dai discloses the EADCM comprising: equalization circuit 14 is a distortion equalizer.

Regarding claim 16, Dai discloses in figure 18, the distortion equalizer 14 is a decision feedback equalizer DFE.

Regarding claim 18, Dai discloses the EADCM provides signal quality distortion measurement (see Figure 1) to the controller 28.

Regarding claims 19 and 20, Dai discloses the EADCM provides signal error value and symbol error estimates (see Figure 1) to the controller 28.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dai et al. U.S. (Publication no. 2003/0011847) in view of Wan et al. U.S. (Publication no. 2004/0086274).

Regarding claim 5, Dai discloses all the limitations except for an Optical Amplifier with Automatic Gain Control (OAGC). Wan discloses an optical system comprises an Optical Amplifier with Automatic Gain Control (OAGC) (figure 1, element 112, page 4, paragraph 0092). At the time of the invention was made, one of the ordinary skill in the art would have been motivated to incorporate OAGC taught by Wan in the system of Dai. Therefore, it would have been obvious to a person of ordinary skill in the art at

the time of the invention was made to incorporate an optical amplifier such as Optical Amplifier with Automatic Gain Control (OAGC) taught by Wan along the transmission line or coupled it with the OADCM and the controller in the system of Dai. It is notoriously known that optical amplifiers can be placed anywhere along the transmission path in an optical system to boost the signal and to restore the signal strength so that acceptable or good quality signal can be received.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dai et al. U.S. (Publication no. 2003/0011847) in view of Wan et al. U.S. (Publication no. 2004/0086274) and further in view of O'Sullivan et al. U.S. (Patent no. 5,822,094).

Regarding claim 6, the combination of Dai and Wan discloses photodiode detector 11 coupled with a trans-impedance amplifier TIA 12. The combination of Dai and Wan does not specifically disclose the system further comprises a PIN photodiode detector in combination with a trans-impedance amplifier (PIN/TIA). O'Sullivan discloses an optical system having a photodiode comprises a PIN photodiode detector in combination with a trans-impedance amplifier (PIN/TIA). At the time of the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the photo-detecting device 11 and TIA 12 of Dai with the PIN photodiode detector in combination with a trans-impedance amplifier taught by O'Sullivan. One of ordinary skill in the art would have been motivated to do this since PIN photodiode detector in combination with a trans-impedance amplifier offers advantages over the photodiode that is converts the incident light into an electrical current which is amplified and band

Art Unit: 2613

limited between the desired range of bandwidth by the trans-impedance amplifier instead of converts the incident light into an electrical current only.

Response to Arguments

7. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

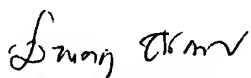
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung D Tran whose telephone number is (571) 272-3025. The examiner can normally be reached on 9:00 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2613

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dzung Tran
01/29/2007


DZUNG TRAN
PRIMARY PATENT EXAMINER